REMARKS

Applicant respectfully notes that 6-8 and 13-15 do not appear to be rejected over prior art. Hence, Applicant consider the subject matter of claims 6-8 and 13-15 as allowable, if the 35 U.S.C. §112, 1st and 2nd paragraphs, rejections set forth in the Office Action are overcome.

Reconsideration of the pending application is respectfully requested on the basis of the following particulars:

1.   Amendments and Support for Same

By the Response, claims 1, 6, 7, 9, 13, and 14 have been amended to more particularly point out and distinctly claim the subject matter of the invention. Claim 17 has been amended to change its dependency from claim 2 to claim 1, and claim 18 has been cancelled. No new matter has been added. Accordingly, claims 1-17 are respectfully submitted for consideration. Approval and entry of the amendments are respectfully requested.

2.   Claim rejections under 35 U.S.C. §112, 1st and 2nd paragraph

With respect to the rejection of claim 1-18 under 35 U.S.C. §112 1st as lacking enablement, Applicant respectfully submits that the claimed invention is directed to the measurement of irrotational and sourceless vector fields. How is this accomplished is detailed in the specification and is evident by the limitations recited in the claims.

Further, Applicant respectfully submits that the specification is written for the level of skill in the art. See, e.g., *In re Lange* , and *In re Smythe*.

In re Lange (CCPA 209 USPQ 288, 294 (1981), the Court held that the disclosure of an application must be read in light of the knowledge possessed by those skilled in the art and that such knowledge can be established by reference to patents or publications.

Likewise, in *In re Smythe*, 480 F.2d 1376, 1382, 178 USPQ 279, 284 (CCPA 1973), the Court stated that it is only required, for example, that the specification describe the invention sufficiently for those of ordinary skill in the art to recognize that the Applicant invented the subject matter he now claims.

With regard to the Examiner's contention that an actual equation is never given for calculating an multi-pole expansion of the field, Applicant respectfully asserts that, while the calculation of a multi-pole expansion in combination with other claimed features of the present invention is believed to be novel, a multi-pole expansion itself is a mathematical series, and is discussed in detail in the amended specification, particularly page 8 of the specification, as submitted in the Amendment of November 21, 2006. Hence, the calculation of a multi-pole expansion in claim 9 does not need to be described in detail in the claim.

With respect to the rejection of claim 1-18 under 35 U.S.C. §112, 2nd paragraph, as being indefinite, as the term "efficiently" is deemed as a relative term, and as there no criteria presented to show how the function is "freely" selected. In response, Applicant has amended the claims to delete the term "efficiently" and "freely."

With respect to the variables and terms in the claimed equations are not fully defined, Applicant has amended the claims to define all the terms and variables.

With respect to the Examiner's contention that it is unclear what "2, 2^1, 2^2, ... 2^n" in line 6 of claim 9 represent, Applicant respectfully submits that it is explicitly stated in the claim, as well as in the specification, that measurement sensors 2, 2^1, 2^2, ... 2^n correspond to measurement channels 1, 1^1, 1^2, ... 1^n. The Examiner is invited to also see, for example, line 8 from the bottom of the last paragraph of page 6 of the specification for support.

Further, with respect to the Examiner's confusion regarding the phrase "which sensors are mutually orthogonal," Applicant has amended "sensors" as "signals" in claim 9, as supported in the previously amended last paragraph in page 3 of the specification.

With respect to claim 18 reciting identical limitations as in claim 9, Applicant has cancelled claim 18.

In view of the amendments and arguments set forth above, Applicant respectfully requests reconsideration and withdrawal of the §112, 1st and 2nd paragraph, rejections of claims 1-18.

3.   Rejection under 35 U.S.C. §102(b)

With respect to the rejection of claims 1-5, 9-12, and 16-18 under 35 U.S.C. §102(b) as being anticipated by Robinson (US 6,370,414), Applicant respectfully traverses the rejection at least for the reason that Robinson fails describe each and every limitation recited in the rejected claims.

The presently claimed invention is directed to a method and a measuring apparatus for examining the continuous current distribution of an object by measuring the magnetic field in the vicinity of the object. According to the method and apparatus of the present invention, measured signals of multiple channels are transformed (i.e., converted) into signals of desired virtual channels and sensors. Thus, the signals of the virtual sensors describe the actual field.

Further, according to the present invention, basis vector components are calculated from the virtual channel signals, wherein the basis vectors are chosen in a way that describes mutually the most independent features of the examined current distribution. Thus, the basis vectors are mutually orthogonal.

Still further, virtual signals are calculated by forming a multi-pole expansion from the multi-channel measurement signals. When calculating the multi-pole expansion, the fields originated from external sources may also be taken into account. The elimination of external interferences before the transform (i.e., converting) is described in patent publication FI20030392, as discussed in the paragraph bridging page 3 and 4 of the specification. Moreover, as discussed in the aforementioned specification, an advantageous feature of the present invention is that after the transform the source model needs not be regularized anymore.

Another advantage of the present invention is that no statistical analysis is required in the transform procedure of the measured signals into the virtual channels.

Additionally, according to the present invention, the weighting of the current distribution model as a function of depth may be modified in the calculation.

In contrast with Applicant's claimed invention, Robinson generally describes a method in which a magnetic field is measured, and the measured magnetic field is transformed into a current distribution estimate of the measured target. This is achieved by defining virtual channels, which are formed computationally from the original measured channels. However, the transform is based on statistical processes. In other words, Robinson

is different from Applicant's claimed invention at least because Robinson defines virtual channels wherein the transform into the virtual channels requires the use of statistical methods for the measured field.

Applicant respectfully submits that an advantage of the present invention is that no statistical analysis is required in the transform procedure of the measured signals into the virtual channels.

In other words, Robinson does not anticipate the presently claimed invention because Robinson fails to describe determining the current distribution of the object being measured from the signals of the set of virtual sensors in a predetermined function basis, as recited in amended claim 1. Moreover, Robinson does not anticipate the presently claimed invention because Robinson fails to describe calculation means for determining the current distribution of an object being examined from the set of virtual sensors using depth r in a predetermined orthonormal function basis, as recited in apparatus claim 9.

Still further, Robinson does not describe the current distribution using an orthonormal function basis using equation

$$\vec{J}(\vec{r}) = \sum_{l=0}^{L} \sum_{m=-l}^{l} c_{lm} f_l(r) \vec{X}_{lm}(\theta, \varphi),$$

as recited in, e.g., dependent claims 6 and 13.

As remarked above, the features recited in claims 6-8 and 13-15 appear to be allowable, as Robinson does not appear to teach, disclose, or suggest the features recited in claims 6-8 and 13-15.

With respect to the rejection of dependent claims 2-5, 10-12, and 16-17, the amendments and arguments set forth above in relation to independent claims 1 and 9 are also applicable to their respective dependent claims.

Consequently, since each and every feature of the present claims is not taught (and is not inherent) in Robinson, as is required by MPEP Chapter 2131 in order to establish anticipation, the rejection of claims 1-17, under 35 U.S.C. §102(b), as anticipated by Robinson is improper.

In view of the amendment and arguments set forth above, Applicant respectfully requests the Examiner to consider the prior art in its entirety as set forth in MPEP 2141.02(VI). Further, Applicant respectfully requests reconsideration and withdrawal of the §102(b) rejection of claims 1-5, 9-12, and 16-18.

Conclusion

In view of the amendments to the claims, and in further view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is requested that claims 1-17 be allowed and the application be passed to issue.

If any issues remain that may be resolved by a telephone or facsimile communication with the Applicant's representative, the Examiner is invited to contact the undersigned at the numbers shown.

Further, while no fees are believed to be due, the Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 50-4525.

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Respectfully submitted,

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